

### Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of the claims in the application.

#### Listing of Claims:

Claims 1-27 (canceled)

28. (currently amended) A method for producing a cyclohexene derivative product library comprising contacting a mixture of first reactants each coupled to a member of a nucleic acid test mixture with a mixture of ~~different~~ free reactants, wherein:

each said first reactant is a dienophile and each said free reactant is a diene, or

each said first reactant is a diene and each said free reactant is a dienophile;

and

wherein said product library ~~comprises a mixture of products and~~ is formed as a result of a Diels-Alder bond formation reaction between said first reactants and at least one of said free reactants, wherein said Diels-Alder bond formation reaction is facilitated by the nucleic acid coupled to said first reactant.

29. (previously presented) The method of claim 28 wherein a linker group is coupled between each said first reactant and said nucleic acid.

30. (previously presented) The method of claim 29 wherein said linker group has a size in the range of 10 to 1000 Å.

31. (previously presented) The method of claim 30 wherein said linker group is selected from the group consisting of PEG, polyvinyl alcohol, polyacrylates and polypeptides.

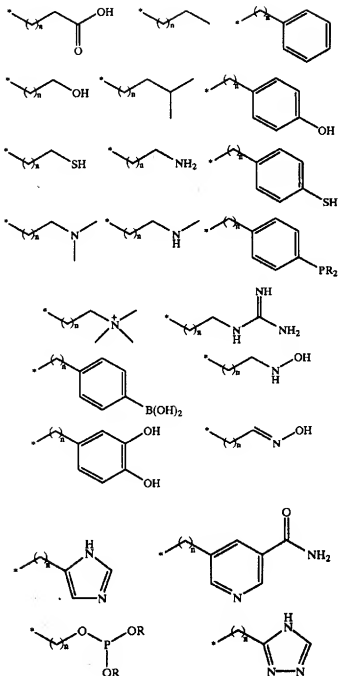
32. (previously presented) The method of claim 28 wherein said nucleic acid test mixture comprises nucleic acids each having a region of conserved sequences and a region of randomized sequences.

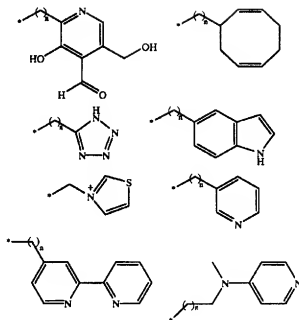
33. (previously presented) The method of claim 28 wherein each member of said nucleic acid test mixture is selected from the group consisting of single-stranded RNA, single-stranded DNA, and double-stranded DNA.

34. (previously presented) The method of claim 28 wherein each said first reactant is a diene and each said free reactant is a dienophile.

35. (previously presented) The method of claim 28 wherein each said first reactant is a dienophile and each said free reactant is a diene.

36. (previously presented) The method of claim 28 wherein said nucleic acid test mixture comprises nucleic acids having one or more functional groups selected from the group consisting of





wherein the asterisk indicates the point of attachment of the chemical group to the nucleic acid,  $n$  may be any integer and wherein said chemical groups may be substituted at aliphatic or aromatic positions.

37. (previously presented) The method of claim 36 wherein said functional group is on a ribose position of said nucleic acid.

38. (previously presented) The method of claim 36 wherein said functional group is on a base position of said nucleic acid.

39. (Previously presented) The method of claim 36 wherein said functional group is on a phosphate position of said nucleic acid.

Claims 40-52 (canceled)